



Getting More Bang for Your Buck — The Cannon Artillery Mortar Munitions Integrated Product Team

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Munitions have become more costly to design, build, maintain and demilitarize because of increased sophistication, new performance objectives and additional regulatory requirements. In response, the entire ammunition community — users, developers and industry — is engaged in efforts to find more responsive and cost-effective ways of satisfying warfighter needs while complying with regulatory requirements.

A Soldier places a high-explosive round in the tube to be fired at a range in Baghdad, Feb. 5, 2004. U.S. Army photo by SFC Alexander Rucker.

The coordination of life-cycle management, modernization and cost-reduction efforts for artillery and mortar munitions is accomplished through the Cannon Artillery Mortar Munitions (CAMM) Integrated Product Team (IPT). The CAMM IPT is managed by Project Manager Combat Ammunition Systems (PM CAS). PM CAS falls under the Program Executive Office for Ammunition (PEO AMMO) structure. In January 2002, PEO AMMO assumed command of research, development, production, demilitarization and life-cycle management for ammunition. As the single manager for conventional ammunition, PEO AMMO also manages DOD's organic and industrial munitions production base. PEO AMMO objectives include:

- Unifying and integrating ammunition management by consolidating responsibility and resource management within the PEO.
- Developing a unified munitions acquisition strategy.
- Developing an industrial base strategy (organic and commercial).

Conventional Ammo

As the Army's one-stop shop for artillery and mortar munitions life-cycle management, PM CAS manages more than 60 munitions and armament products from development through production and into sustainment. These products include shell bodies, fuzes, precision and smart munitions, mortar weapons, fire-control systems and propellants and explosives. PM CAS manages the conventional artillery and mortar inventory as well as new items under development.

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Most conventional ammunition inventory items were designed 20 years ago and have several advantages — they are in the inventory, can be manufactured by our existing industrial base and cost less to produce than new, more sophisticated types of ammunition. New

munitions under development use the latest precision technology. This means they are more accurate and less likely to cause collateral damage. In addition to incorporating insensitive munitions (IM) features to better protect our military personnel, they are also designed to be more environmentally friendly and easier to demilitarize (demil).

For example, the M795 155mm High Explosive Artillery and M934 120mm High Explosive Mortar rounds are conventional artillery and mortar rounds found in the current munitions inventory. Both rounds have lower associated production costs than the new wave of ammunition,

are readily available and can be mass-produced by the existing industrial base. However, the challenge for artillerymen when these rounds are fired is that they are not as accurate for precision strikes during contingency operations. Additionally, collateral damage cannot be controlled and they present significant maintenance and demil issues for logisticians. Current operational requirements dictate that IM features be incorporated into these munitions' redesign.

Future Capability Ammo

Future capability artillery and mortar ammunition like the XM982 155mm Excalibur Extended Range Precision Guided Artillery Projectile and XM935 120mm Precision Guided Mortar Munition have been designed for increased accuracy to reduce potential collateral damage, have IM features incorporated, are environmentally friendly and can be easily demilitarized. However, these new rounds will have a higher per-unit production cost and will require more sophisticated manufacturing processes that will lead to several industrial base producibility issues.



Artillerymen fire an M109A6 Howitzer during a live-fire exercise, sending high-explosive rounds to a range 9.5 kilometers away. U.S. Air Force photo by TSGT John Houghton.

CAMM IPT

CAMM IPT will provide integrated life-cycle management and strategic and operational planning in concert with all involved stakeholders for PEO AMMO, thereby supporting the Army's transformation by providing the most effective ammunition available worldwide. CAMM IPT, a multi-service, multifunctional group, will address long- and short-term issues and requirements while engaging in an integrated approach to achieving the following cannon artillery and mortar munitions life-cycle objectives:

- Supply better products to our Soldiers.
- Improve logistics and sustainability.
- Reduce total ownership costs.
- Identify and implement programs that support current and future weapon systems.
- Provide interservice coordination.

Different organizations have expertise in different areas of the life cycle. CAMM IPT will bring these parties to the table to discuss the total life cycle and to capture best business practices. The IPT brings all the stakeholders and industry together to address issues and explore methodologies that can benefit government and industry alike. The IPT speaks with one voice for the artillery and mortar munitions community to HQDA and DOD leaders.

Before the CAMM IPT was formed, responsibility for managing life-cycle activities was segmented. As issues arose, they were addressed item-by-item in a "stovepipe" and highly sequentialized manner. Under CAMM IPT, integrated efforts will eliminate time-consuming constraints.

The CAMM IPT includes all cannon artillery and mortar munition stakeholders, who meet quarterly to identify and

work on life-cycle issues by converting ideas into actions. Emphasis is placed on reducing total ownership costs and producing both tangible and intangible benefits. The IPT's activities include:

- Networking.
- Addressing mortar and artillery ammunition challenges and opportunities brought by stakeholders and industry.
- Presenting informative briefings to government and industry representatives.
- Planning and coordinating.



PFC Jonathan Morgan, Headquarters Company, 2nd Battalion, 22nd Infantry Regiment, 10th Mountain Division (Light Infantry), uses the sights to align his mortar as part of a blocking position on a return trip from Daychopan, Afghanistan, December 2003, during *Operation Enduring Freedom*. U.S. Army photo by SGT Horace Murray, 982nd Signal Company.

The CAMM IPT artillery and mortar Tiger Teams function as its working groups. The Tiger Teams comprise core members (government) only and are responsible for working the action items and developing strategic plans. Tiger Teams have biweekly teleconferences and meet face-to-face when required.

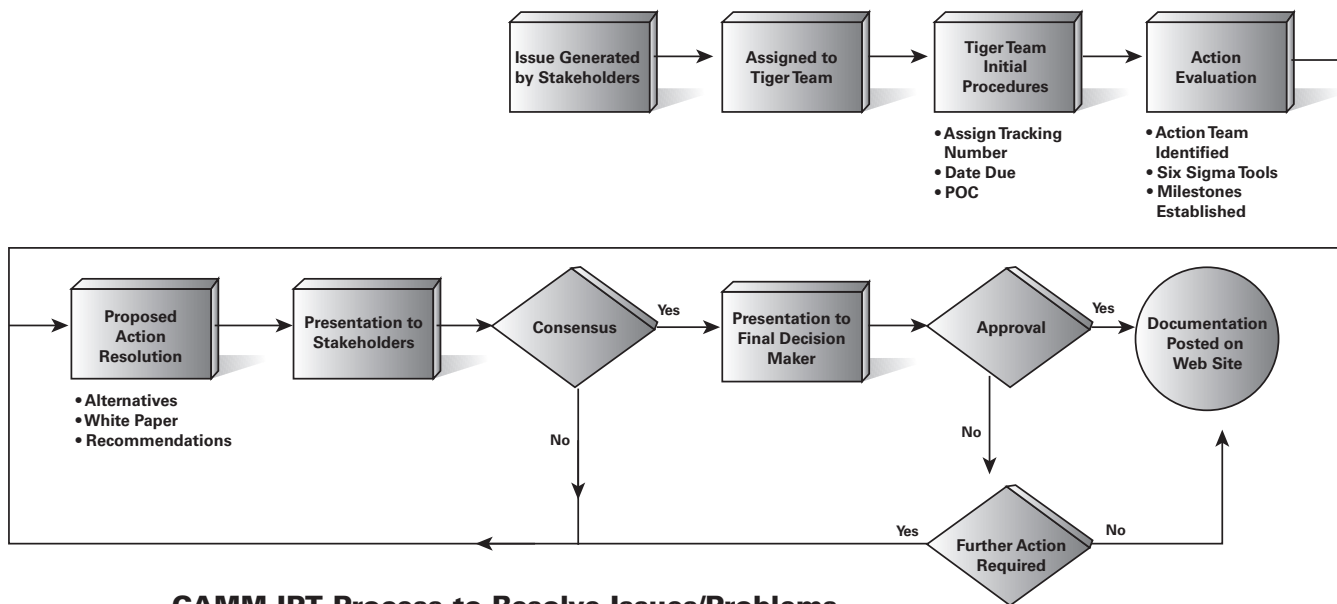
The CAMM IPT Tiger Teams are proactive and continuously oriented toward developing action plans and implementing solutions to issues. By setting priorities among the myriad potential action items, the IPT identifies yearly "thrust areas" that direct and focus the team's efforts. For each thrust area, a detailed milestone plan for accomplishment is developed. For 2003, the CAMM IPT identified the following action items:

- Obtain additional maintenance funding.
- Revitalize the aging stockpile.
- Reduce life-cycle costs.
- Find alternative IM solutions.

CAMM IPT's Web site offers a convenient means of informing all members of new developments and serves as a repository for CAMM IPT-generated documents and briefings. The Web site is located at <http://www.cannonartillery.org>. There are two sections: government only, and government and industry. Both are password-protected.

The CAMM IPT takes a streamlined, straightforward approach to resolving issues. The figure on the next page summarizes this approach.

Since its inception in 1998, the CAMM IPT has generated 322 action items for resolution by the IPT or its Tiger Teams — 292 action items have been completed and 30 are ongoing. One such completed action item was the implementation of an Obturator Retrofit Program for the 155mm M549 artillery projectile. The obturator seal prevents the escape of propellant gases around a gun's breechblock. The original obturator for the 155mm M549 projectile deteriorated over time and was not compatible with new gun systems. As a result of this program, stored M549 projectiles are being



CAMM IPT Process to Resolve Issues/Problems

retrofitted with newly designed obturators that are compatible with new gun systems and also extend tube life and improve munition precision.

Another high-priority action item was securing funding to develop an IM modification for 155mm M795/M107 high-explosive projectiles. The IM program is designed to make U.S. Army ammunition safer from external threats while continuing to meet current required performance parameters.

Further, the CAMM IPT completed an engineering study that recommended replacing the existing 105mm M67 propelling charge rayon bag with an improved acrylic bag.

The rayon bags were deteriorating in storage in as few as 3 years. The new acrylic material bags are expected to last a minimum of 35 years and will provide permanent solutions for new

M67 propelling charges, allowing the Army to sustain training with the existing stockpile.

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Another CAMM IPT accomplishment during the past year was a Life Cycle Cost Reduction/Value Engineering (VE) Session held for development community representatives, program/project managers and select groups involved in manufacturing, maintenance, item management, stockpile surveillance and demil. The session featured a VE training update on cost-reduction techniques and provided a forum for discussing life-cycle issues among the functional area representatives. Time was allotted for brainstorming to develop individual cost-reduction proposals and item project cost-reduction plans. The effort has already begun to pay off. For the 155mm M795 projectile, savings of \$4.6 million have been realized with

another \$720,000 per year in cost reductions anticipated. For the 155mm XM982 Excalibur, steps taken to incorporate lean design may reduce the projectile cost by as much as 30 percent. The ideas generated in the session will be used to develop cost-reduction proposals for the 120mm precision-guided mortar munition design and 155mm M864 projectile recapitalization effort.

CAMM IPT accomplishments to date demonstrate that this type of integrated approach provides an effective way of meeting the challenges posed by a rapidly changing defense environment.

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